(Pages: 2) **Reg. No: …..……..... **

Name: ……..……...

M.TECH. DEGREE EXAMINATION

Model Question Paper - II

First Semester

Branch: Electrical and Electronics Engineering

Specialization: Power Electronics and Power Systems

MEEPP 102 POWER ELECTRONIC CIRCUITS

(2013 admission onwards)

Time: Three Hours Maximum: 100 Marks

1. (a) Explain the various types of triggering methods of SCR. Which is the universal method and why? (10 marks)

(b) Give the comparison between transistors and MOSFETS. (8 marks)

(c) Explain the dynamic characteristics of IGBT. (7 marks)

OR

2. (a) Discuss the overvoltage, over current, di/di and dv/dt protection of power semiconductor device. (10 marks)

(b) Discuss the principle of operation of TRIAC. (8 marks)

(c) Distinguish the characteristics of practical switches and ideal switches? (7 marks)

3. (a) Explain the operation of three phase uncontrolled rectifier with RL load, Draw neat circuit diagram and waveform. Obtain the expression of output voltage, current, THD, and PF. (15 marks)

(b). Discuss the effect of single phase rectifiers on Neutral currents in a three-phase four wire system. (10 marks)

OR

4. (a) Discuss the working of single phase controlled with RLE Load. Obtain the performance parameters. (7 marks)

(b) A three phase fully controlled bridge converter is connected to a highly inductive load with resistance of 20Ω. The supply voltage is 400V, 50Hz. Determine the average load voltage and load current for a triggering angle of 30^0. (8 marks)

(c) Explain the effect of source inductance in three phase converter.
(10 marks)

5. (a). Discuss the various classifications of chopper circuits. What is multiphase chopper, explain it.
(15 marks)

(b). What are the various control strategies of chopper.
(10 marks)

OR

6. (a). Explain the operation of three phase VSI with necessary waveforms.
(15 marks)

(b) Discuss briefly the various methods used for the waveform improvement of voltage source inverters. (10 marks)

7. (a). Investigate the operation of single – phase voltage controller supplying RL load when the firing angle α is:
   (i) Less than the load angle ϕ
   (ii) Equal to load angle ϕ
   (iii) Greater than load angle ϕ
(12 marks)

(b). A Single phase AC Voltage controller is connected to a resistive load of 30Ω. The AC supply is 230V, 50Hz. Determine the r.m.s load voltage and r.m.s load current for a firing angle of 45^0. (7 marks)

(c) Explain briefly Thyristor Controlled Inductor. (6 marks)

OR

8. (a) Explain the operation of a 3-phase cycloconverter. Draw the waveforms.
(15 marks)

(b). Explain the operation of a single phase Bridge type cycloconverter. Draw the waveforms.
(10 marks)

[4 x 25 = 100 marks]